

The Light is one of the biggest phenomena in the Universe. It is referred to in both science and religion, humans gather 80% of information from their environment using eyesight, nothing is possible without the Light. Can you imagine life without the Light? Try to close your eyes and do the daily routine. I bet you will look very soon or start developing other senses like many species did in the course of the evolution - especially those in the deep seas or underground where there is little or no sunlight (eyes get larger and pupils extend, sound / smell / taste perceptions improve, body hair transforms into the receptors, skin fattens or densens and intensifies its reception of ambient vibrations). But do you know what is the Light and how it travels? No, you don't. Neither did I. The difference between me and you is that I asked myself that question and searched for an answer. The Internet is always the first choice: it is easily accessible and all of the literature is practically available on-line. I couldn't find the exact data. When I typed "how photon travels" I constantly received this reply: "because of the low air density". Such a particulate answer. I didn't ask "why photon travels in the contrast to the primordial plasma soup" - I simply asked "how photon travels". I had to comprise the answer by myself from different scientific sources at the disposal and fragmented information scattered across the web.

How photon (the Light) travels? Because of the frequency coherence between a photon and an electron: if their waves correspond then photon passes through the medium (material), more or less refracting depending on the level of the synchronicity and due to an electron orbital transition caused by its excitation with incoming light particle. If frequencies do not match then photon gets reflected off the surface of the medium (material) which again depends on the level of decoherence. There is one more situation which occurs between or on the borders of the photon-electron coherence / decoherence: absorption or transformation of the light energy thermodynamically (black or dense objects) or chemically (Chlorophyll in the green plants).

<https://primary.jwwb.nl/public/z/h/o/temp-fjndzoiqqbsgaxnmaduwhow-light-travels.jpg>

Why are leaves green? Because chlorophylls are absorbing the Light's red and blue spectrum while reflecting the green part. They absorb the light through the process called photosynthesis which is actually a merging of the red and blue waves into the chemical compounds (carbohydrate molecules). How sophisticated! It allows plants to use almost 100% of the sunlight, perhaps all.

The Light is just the visible part of the EM spectrum and the smallest one which means that humans can only see tiny bit of the whole picture. It doesn't stop them to pretentiously exaggerate about themselves and their pathetic civilization torn in ages long mutual conflicts and elites decadence.

There is an intentional religious misconception, arising from the human egoism, that the Light was created for us to see. No, we developed eyes and eyesight, in the course of the evolution, to use the Light which existence was prior to ours. Consequence can not precede the cause. Just in religious rethorics. Or you claim that humanity is 14 billion years old? From several thousand to the fourteen billion - what a jump! Only available in the fanatical minds.

What is the Light? The Light is a visible part of the electromagnetic spectrum which existence is caused by the emission of the photons (light energy) as the direct consequence of the nuclear radiation process, accompanied with the by-products releasement, either in the Stars or artificially originated.

Some of the important terms related to the Light:

Photometry - is the science of the measurement of the light regarding the brightness perceived in the human eye. SI unit is lux (lx) which equals to the one lumen (lm) per square meter (m) or  $1 \text{ lx} = 1 \text{ lm/m}^2$  and is defined as the illuminance or an amount of the luminous flux spread over the surface.

Lumen (lm) - is the SI unit of the luminous flux.

Candela (cd) is the SI unit of the luminous intensity.

One lumen equals one candela in a solid angle of one steradian or  $1 \text{ lm} = \text{cd} \times \text{sr}$ .

Steradian (sr) is a dimensionless unit of the solid angle ( $\Omega$ ) which equals the ratio of the spherical surface area (A) and the radius of the sphere (r) or  $\Omega = A / r^2$ .

Photometer is a device that measures the strength of an electromagnetic radiation as the amount of brightness perceived by the human eye.

Radiometry - is the science of the measurement of the radiant electromagnetic energy regarding its power distribution through the space. SI unit is joule (J) which equals to the  $\text{m} (\text{kg}) \times \text{m}^2 (\text{m}^2) \times \text{s}^{-2} (\text{s}^{-2})$  or  $J = \text{m}^2 \text{s}^{-2}$  and is defined as the radiance or an amount of work done when a force of 1 newton (N) displaces a mass through a distance of 1 meter (m).

Watt per steradian (W/sr) is the SI unit of the radiant intensity.

Watt is the SI unit of the power or radiant flux equaling 1 joule per second or  $1 \text{ W} = 1 \text{ J} / \text{s}$ .

Radiometer is an instrument that measures the radiant flux (power) of an electromagnetic radiation.

I will probably need an entire week just to memorize this basic set of terms

and units related to the science of the measuring of an electromagnetic intensity.

Electron and photon act both as a particle and a wave which is shown by the double slit experiment.

Particle is a tiny, dot like object that has volume, density, mass and chemical structure.

Wave is a spreading progressive activity which has two main characteristics: length and frequency.

Wavelength is a distance between two corresponding points on two consecutive, adjacent oscillations.

Frequency is an amount of wave reoccurrences.

SI unit for the frequency is Hertz (Hz). It equals one event per second:

$$f = 1 / T$$

$$1 \text{ Hz} = 1 / \text{sec}$$

The Light is visible part of an electromagnetic spectrum ranging between approx. 400 and 700 nm.

Colours of the visible light spectrum are:

Red: 665 nm

Orange: 630 nm

Yellow: 600 nm

Green: 550 nm

Blue: 470 nm

Indigo: 425 nm

Violet: 400 nm